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Appl. No. 09/764,163
Amdt. dated April 16, 2007
Reply to Office Action of December 15, 2006

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. - 79. (Canceled)

80. (Currently amended) A polypeptide consisting essentially of:
a first and a second interactor domain, and a circularly permuted TEM-1 β -lactamase protein;

wherein the first interactor domain binds to a single ligand, and the first interactor domain is selected from the group consisting of an antibody, an antigen, a first monomer of a hetero-dimerizing helix, a second monomer of a hetero-dimerizing helix, a receptor, and a scaffold peptide;

wherein the second interactor domain binds to said single ligand, and the second interactor domain is selected from the group consisting of an antibody, an antigen, a first monomer of a hetero-dimerizing helix, a second monomer of a hetero-dimerizing helix, a receptor, and a scaffold peptide;

wherein the first interactor domain is fused to the circularly permuted β -lactamase protein through the N-terminal breakpoint break-point of the circularly permuted β -lactamase protein and the second interactor domain is fused to the circularly permuted β -lactamase protein through the C-terminal breakpoint break-point of the circularly permuted β -lactamase protein,

wherein said N-terminal break-point and said C-terminal break-point are within 10 amino acids in either direction from a junction of 2 amino acid residues located between alpha-helices 7 and 8 of said TEM-1 β -lactamase protein,

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wherein said circularly permuted TEM-1 β -lactamase protein is functionally reconstituted only upon binding of said first interactor domain and said second interactor domain to a said single ligand.

81. - 83. (Canceled)

84. (Currently amended) The polypeptide of claim 80, wherein said N-terminal ~~break-point~~ break-point and said C-terminal ~~break-point~~ break-point are within a solvent exposed loop between elements of secondary structure within the β -lactamase protein.

85. (Currently amended) The polypeptide of claim 80, wherein said circularly permuted β -lactamase protein consists of amino acids 26 to 288 of the following sequence prior to circular permutation:

His	Pro	Glu	Thr	Leu	Val	Lys	Val	Lys	Asp	Ala	Glu	Asp	Gln	Leu	Gly
26				30				35						40	
Ala	Arg	Val	Gly	Tyr	Ile	Glu	Leu	Asp	Leu	Asn	Ser	Gly	Lys	Ile	Leu
			45					50						55	
Glu	Ser	Phe	Arg	Pro	Glu	Glu	Arg	Phe	Pro	Met	Met	Ser	Thr	Phe	Lys
			60					65						70	
Val	Leu	Leu	Cys	Gly	Ala	Val	Leu	Ser	Arg	Ile	Asp	Ala	Gly	Gln	Glu
			75					80						85	
Gln	Leu	Gly	Arg	Arg	Ile	His	Tyr	Ser	Gln	Asn	Asp	Leu	Val	Glu	Tyr
			90					95				100		105	
Ser	Pro	Val	Thr	Glu	Lys	His	Leu	Thr	Asp	Gly	Met	Thr	Val	Arg	Glu
							110					115		120	
Leu	Cys	Ser	Ala	Ala	Ile	Thr	Met	Ser	Asp	Asn	Thr	Ala	Ala	Asn	Leu
			125					130						135	
Leu	Leu	Thr	Thr	Ile	Gly	Gly	Pro	Lys	Glu	Leu	Thr	Ala	Phe	Leu	His
			140					145						150	
Asn	Met	Gly	Asp	His	Val	Thr	Arg	Leu	Asp	Arg	Trp	Glu	Pro	Glu	Leu

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155	160	165	
Asn Glu Ala Ile Pro Asn Asp Glu Arg Asp Thr Thr Met Pro Val Ala			
170	175	180	185
Met Ala Thr Thr Leu Arg Lys Leu Leu Thr Gly Glu Leu Leu Thr Leu			
	190	195	200
Ala Ser Arg Gln Gln Leu Ile Asp Trp Met Glu Ala Asp Lys Val Ala			
	205	210	215
Gly Pro Leu Leu Arg Ser Ala Leu Pro Ala Gly Trp Phe Ile Ala Asp			
	220	225	230
Lys Ser Gly Ala Gly Glu Arg Gly Ser Arg Gly Ile Ile Ala Ala Leu			
	235	240	245
Gly Pro Asp Gly Lys Pro Ser Arg Ile Val Val Ile Tyr Thr Thr Gly			
250	255	260	265
Ser Gln Ala Thr Met Asp Glu Arg Asn Arg Gln Ile Ala Glu Ile Gly			
	270	275	280
Ala Ser Leu Ile Lys His Trp			

285

(SEQ ID NO: 2);

~~wherein said N-terminal breakpoint and said C-terminal breakpoint are within 10 amino acids of an amide bond junction between two amino acids selected from the group consisting of asparagine 52 and serine 53, leucine 91 and glycine 92, glutamine 99 and asparagine 100, proline 174 and asparagine 175, glutamic acid 197 and leucine 198, lysine 215 and valine 216, alanine 227 and glycine 228, and glycine 253 and lysine 254.~~

86. (Canceled).

87. (Previously presented) The polypeptide of claim 85, wherein the breakpoint is between said two amino acids are glutamic acid 197 and leucine 198.

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88. (Previously presented) The polypeptide of claim 80, wherein said ligand is a protein ligand.

89. (Canceled).

90. (New) The polypeptide of claim 80, wherein when said first interactor domain is an antibody, said second interactor domain is a first monomer of a hetero-dimerizing helix, and said ligand is an antigen-second monomer of hetero-dimerizing helix fusion protein, wherein the antibody specifically binds to the antigen; or

when said first interactor domain is an antibody, said second interactor domain is a first monomer of a hetero-dimerizing helix, and said ligand is a second monomer of hetero-dimerizing helix-antigen fusion protein, wherein the antibody specifically binds to the antigen; or

when said first interactor domain is an antigen, said second interactor domain is a first monomer of a hetero-dimerizing helix, and said ligand is an antibody-second monomer of hetero-dimerizing helix fusion protein, wherein the antigen specifically binds to the antibody; or

when said first interactor domain is a first monomer of a hetero-dimerizing helix, said second interactor domain is an antigen, and said ligand is an antibody-second monomer of hetero-dimerizing helix fusion protein, wherein the antigen specifically binds to the antibody.

91. (New) The polypeptide of claim 90, wherein said first monomer of a hetero-dimerizing helix and said second monomer of a hetero-dimerizing helix are selected from the group consisting of c-fos and c-jun.

92. (New) The polypeptide of claim 90, wherein the antibody is an scFv.

93. (New) The polypeptide of claim 90, wherein the antigen is selected from the group consisting of a receptor protein and a scaffold peptide.

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94. (New) The polypeptide of claim 80, wherein said first interactor domain is a scFv antibody, said second interactor domain is a jun helix monomer, and said ligand is an antigen-fos helix fusion protein, wherein the scFv specifically binds to the antigen.

95. (New) The polypeptide of claim 80, wherein said first interactor domain is a scFv antibody, said second interactor domain is a jun helix monomer, and said ligand is a fos helix-antigen fusion protein, wherein the scFv specifically binds to the antigen.

96. (New) The polypeptide of claim 80, wherein said first interactor domain is an antigen, said second interactor domain is a jun helix monomer, and said ligand is a scFv antibody-fos helix fusion protein, wherein the antigen specifically binds to the scFv antibody.

97. (New) The polypeptide of claim 80, wherein said first interactor domain is a fos helix, said second interactor domain is an antigen, and said ligand is a scFv antibody-jun helix fusion protein, wherein the antigen specifically binds to the scFv antibody.